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DESCRIPTION OF A NEW CAVE-DWELLING PHOLCID SPIDER FROM NORTH-WESTERN AUSTRALIA, WITH AN IDENTIFICATION KEY TO THE GENERA OF AUSTRALIAN PHOLCIDAE (ARANEAE)

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ABSTRACT

A new species of cave-dwelling pholcid spider is described. *Trichocyclus septentrionalis* sp.nov. was collected in various caves in North West Cape, northern Western Australia; it does not show troglobitic features in its morphology and was also found outside caves. The genus *Trichocyclus* is diagnosed and differences with related genera are indicated. The type species, *T. nigropunctatus* Simon, 1908, is redescribed. An identification key to all pholcid genera of Australia is presented.

INTRODUCTION

Scientific exploration of the Australian cave fauna has been relatively recent. Such explorations have revealed a rich spider fauna associated with caves in many parts of southern Australia (Gray 1973a,b; Main 1976) and more recently in Chillagoe caves and Undara lava tubes. A specialised cave spider fauna was recorded and partly described by Main (1969), Gray (1973a) and Main and Gray (1985). Caves in limestones of different geological ages in Western Australia harbour spiders (Watson, *et al.* 1990). In recent years the Western Australian Museum has conducted extensive surveys of caves in the Cape Range, North West Cape, Western Australia (Humphreys 1991). Nevertheless much of the cave spider fauna of Australia remains undescribed. The pholcid spiders collected in North West Cape belong to one species only. They do not exhibit any morphological cave-adaptations such as reduction of eye size or pigmentation; the environment may however have effected a lengthening of the legs.

The following abbreviations are used: AME, PME: anterior, posterior median eyes; ALE, PLE: anterior, posterior lateral eyes; MNHN: Museum national d'Histoire naturelle, Paris; RMNH: Rijksmuseum van Natuurlijke Historie, Leiden; ZMH: Zoologisches Museum, Hamburg.

KEY TO AUSTRALIAN PHOLCID GENERA

1. Abdomen globular, higher than long or a little longer than high 2
   Abdomen cylindrical 8
2. 6 eyes; male palp with conductor ..... "*Spermophora*" Hentz
   8 eyes; male palp without conductor 3
3. Thorax separated from head by Y-shaped groove, continuous with foveal groove, which extends to posterior margin, male paracymbium not converging and pointed; spinnerets most often close to epigastric fold 4

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Separation head-thorax discontinuous with foveal groove, the latter in the shape of a round or oval depression behind the eye region 6

4. AME almost the size of ALE; male chelicerae with prominent lateral ridge, paracymbium not converging, with blunt or rounded tip ..... *Trichocyclus* Simon

Diameter AME less than half that of ALE 5

5. Male chelicerae with spurs or apophyses or without; palpal femur relatively slender, paracymbium slender; female chelicerae without stridulating ridges, palp normal ... . *Psilochorus* Simon

Male chelicerae partly covered with a two-horned projection of the clypeus; palpal femur bulky, almost as wide as long, paracymbium more voluminous; female chelicerae with stridulating ridges, palpal tarsi swollen ..... *Holocneminus* Berland

6. Male palpal paracymbium converging, tip pointed 7

Male palpal paracymbium spade-like, tip truncate; relatively large spiders .... *Artema* Walckenaer

7. AME situated between ALE; epigyne with one or a pair of hooked prominences in front; palpal femur massive, larger and more bulky than tibia; abdomen higher than long, rounded posteriorly ..... *Physocyclus* Simon

AME in front of ALE; epigyne without hooked prominences; palpal femur smaller than tibia; femora of leg I-IV with dark blotches; abdomen longer than high, produced posteriorly ..... *Crossopriza* Simon

8. Spiders pale green, carapace flat, abdomen vermiform; eye triads widely separated .... *Micromerys* Bradley

Spider not green nor with flat carapace 9

9. Carapace with large round or oval depression behind the eye region; paracymbium converging, tip pointed, no separate conductor 10

Carapace with Y-shaped groove separating head and thorax, separate conductor present 11

10. Male with femur I having a row of ventral spines; female palpal tarsi inflated .... *Holocnemus* Simon

Male without a row of spines on femur I, female palps with tarsus normal .... *Smeringopus* Simon

11. Male palp elongate, paracymbium with one or several transverse chitinous ridges ventrally, conductor one straight sclerite; epigyne a wrinkled scape; six eyes .... *Panjange* Deeleman-Reinhold and Deeleman

Male palp compact, paracymbium with "elbow", without ventral transverse ridges, embolus resting between two branches of conductor; epigyne different; usually eight eyes ..... *Pholcus* Walckenaer

SYSTEMATICS

Trichocyclus Simon, 1908

Trichocyclus Simon, 1908: 407.

Type species

Trichocyclus nigropunctatus Simon, 1908, by monotypy.

Diagnosis

Carapace separated from thorax by deep Y-shaped groove; AME the size of ALE or almost. Abdomen higher than long, spinnerets close to the epigastric fold. Legs moderately long (femur I 4-7 x the length of carapace). Male chelicerae with voluminous lateral ridge or protrusion. Palpal femur massive, paracymbium truncate, embolus in prolongation of bulb, conductor absent. Epigyne bulgy, covered with a pre-genital and a post-genital transverse chitinized plate. Distinct from *Holocneminus* by the large AME and the longer legs (in *Holocneminus* femur I 1-3 x the length of carapace). Distinct from *Physocyclus* by the foveal groove reaching the posterior border of carapace, the large AME and the truncate paracymbium and in the epigyne absence of anterior prominence.

Remarks

The new species is placed in the genus *Trichocyclus* Simon. *Trichocyclus* has sometimes been regarded as a synonym of *Physocyclus* (Main 1964, 1976); Davies (1985) regarded the genus *Trichocyclus* as valid. In fact, it is more closely related to members of *Psilochorus* and *Holocneminus*. The type species of *Trichocyclus*, *T. nigropunctatus* Simon was described from Yalgoo, about 500 km south of Cape Range. It has been collected again, but has never again been recorded in the literature. An adult female labelled "*Trichocyclus nigromaculatus*" (sic), preserved in the Museum in Paris, probably served Simon for the original description. The genus is distinct from related genera by the relatively large anterior median eyes and the male and female sexual organs. I am convinced that the new species described here is congeneric with the type species of *Trichocyclus* in spite of a difference in position of the posterior eyes; this difference in position could very well be correlated with the height of the ocular elevation.

Trichocyclus nigropunctatus Simon, 1908

Figure 1A-F

Trichocyclus nigropunctatus Simon 1908: 407 (description female Yalgoo, Western Australia)

Lectotype

Female, by present designation, labelled "*Trichocyclus nigromaculatus*", (lapsus Simon), Western Australia leg. Michaelsen, MNHN (Collection Simon 23021).

Other material examined

1 nonadult male (ZMH), in poor condition, labelled *Trichocyclus nigropunctatus*, in handwriting Simon, Hamburg S.W.Australien Exp. 1905, Yalgoo 77, E.Simon publ. 1908, Dr.W.Michaelsen dedit 11.VII.1908, later incorrectly added: "holotype" (Rack 1961:57).

Redescription

Measurements in mm (nonadult male, Yalgoo): total length 2 mm, carapace 0.95 long, 0.95

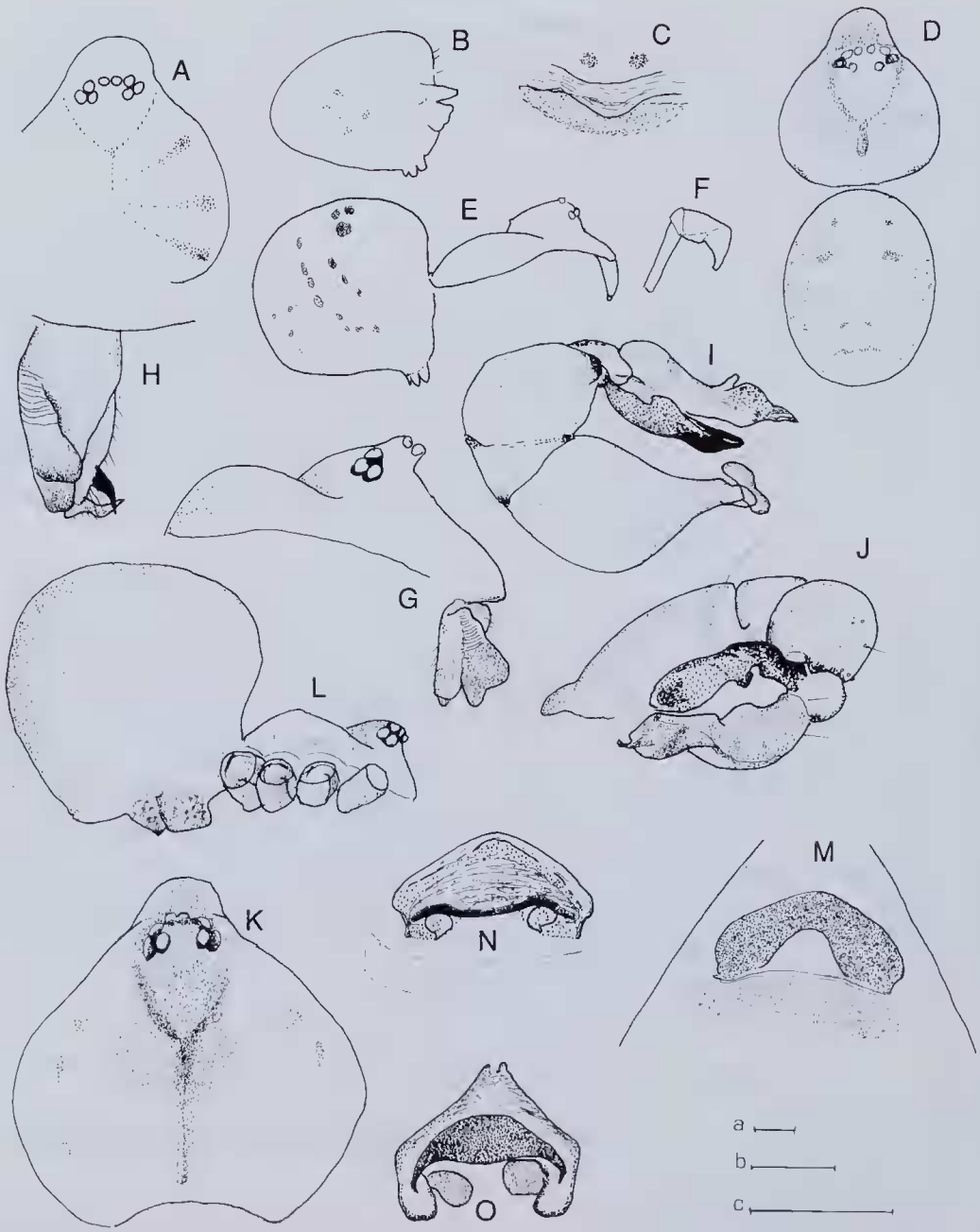

Figure 1 **A-F.** *Trichocyclus nigropunctatus*. **A-C.** Female (Lectotype MNHN 23021). **A**, eye position; **B**, abdomen, lateral; **C**, epigyne; **D-F.** Subadult male (ZMH 77, Yalgoo). **D**, carapace and abdomen, dorsal (b); **E**, id., lateral (b); **F**, palp (b). **G-N.** *Trichocyclus septentrionalis*. **G-J.** Male. **G**, carapace and chelicer, lateral (b); **H**, chelicer, front (c); **I**, right palp, lateral; **J**, id., anterior (b). **K-N.** Female. **K**, carapace (b); **L**, carapace and abdomen, lateral (a); **M**, epigyne (b); **N**, vulva, dorsal (b). **O**, *Physocyclus globosus*, vulva, dorsal (b). Scales in brackets: 0.5 mm.

wide, width eye region 0.45, abdomen 1.20 long. Legs:

	femur	patella	tibia	metatarsus	tarsus	total
I	3.70	0.35	3.45	4.10	1.20	12.80
II	3.10	0.35	2.40	3.20	0.95	10.00
III	2.15	0.35	1.70	2.40	0.80	6.60
IV	3.15	0.35	2.40	3.40	0.80	10.10
palp	0.40	patella + tibia 0.30			tarsus 0.25	

Carapace (Figure 1A,D) with darkened clypeus and foveal area, from the latter radiating dark bands, almost reaching the margin; sternum probably darkened in the middle. Abdomen (Figure 1B,D,E) with irregular groups of black spots. Eye region relatively wide, eyes approximately of equal diameter, AME slightly smaller than ALE or equal, AME ½ diameter apart, touching ALE, posterior eyerow procurved, PME 2 diameters apart, touching PLE. Chelicerae probably without stridulatory ridges. Epigyne Figure 1B,C.

Trichocyclus septentrionalis sp. nov.

Figure 1G-N

Holotype

Male, cave C.227, Cape Range, Western Australia, 22°02'49"S, 114°00'30"E, 24 May 1990, outside cave, J.M.Waldock (WAM 92/629).

Paratypes

Western Australia: Cape Range: 1 male, cave C.162, 22°09'00"S, 113°59'51"E, 22 September 1988, J.M. Waldock (WAM 91/549); 1 male, same data (WAM 91/551); 1 male, cave C.68, 22°05'48"S, 113°58'45"E, 17 May 1990, antechamber, J.M. Waldock (WAM 92/131); 1 male, cave C.106, 22°04'21"S, 114°00'39"E, 21 June 1989, M.S. Harvey (RMNH); 1 male, cave C.177, 22°06'S, 113°58'E, 7 July 1989, M. East (RMNH); 1 female, Bunbury Cave, 21°51'S, 114°043E, 27 September 1988, J.M. Waldock (WAM 91/553); 1 female, cave C.60, 22°06'05"S, 113°59'09"E, 9 July 1989, M. East (WAM 92/634); 1 female, cave C.68, 17 May 1990, antechamber, J.M. Waldock (WAM 92/633); 1 female, cave C.96, 22°15'05"S,113°57'24"E, 19 September 1988, J.M. Waldock (WAM 91/248); 1 female, cave C.111, 22°55'08"S, 114°00'17"E, 5 July 1989, (R. Wood (WAM 92/636); 1 female, id., (WAM 92/635); 1 female, cave C.147, 22°07'34"S,113°59'31"E, 23 June 1989, R. Wood (WAM 92/637); 1 female, cave C.162, 22°09'00"S, 113°59'51"E, 22 September 1988, J.M. Waldock (WAM); 1 female, id., (WAM 91/552) ; 1 female, cave C.162, 20 June 1989, M.S. Harvey (RMNH); 1 female, cave C.177, 22°06'19"S, 113°57'48"E, 7 July 1989, R. Wood (WAM 92/638); 1 female, cave C.177, 7 July 1989, M. East (WAM 92/639); 2 females, cave C.215, 22°01'40"S, 113°55'55"E, 15 July 1989, R. Young (WAM 92/640-1); 1 female, cave C.215, 15 July 1989, M. East (WAM 92/642); 1 female, cave C.224, 21°56'26"S, 114°05'40"E, 30 June 1989, M. East (WAM 92/643); 1 female, cave C.227, 22°02'49"S, 114°00'30"E, 24 May 1990, outside cave, J.M. Waldock (WAM 92/629); 1 female with egg sac, cave C.295, 22°04'11"S, 114°00'53"E, 17 August 1989, M. East (WAM 92/644); 2 females, 1 juv. male, cave C.291, 22°16'01"S, 113°57'53"E, 26 May 1990, antechamber, J.M. Waldock (WAM 92/630-632).

Diagnosis

Distinct from *T. nigropunctatus* by narrower eye region, posterior eye row recurved, different markings of the carapace, larger body dimensions, longer legs and clear differences in the epigyne.

Description

Male

Measurements in mm: male holotype: total length 4.30, carapace 1.90 long, 1.90 wide,

width eye region 0.53, abdomen 2.65 long. Legs:

	femur	patella	tibia	metatarsus	tarsus	total
I	13.90	0.85	14.40	21.10	3.35	53.60
II	11.50	0.85	11.30	16.30	1.90	41.85
III	8.60	0.85	7.70	10.75	1.70	29.60
IV	11.70	0.85	10.10	14.70	1.90	39.25
palp	1.45	0.45	0.95		1.20	

Carapace and legs pale ochre, tip of femora and base and tip of tibiae lighter, head and an area on either side of the fovea dark, three pairs of lateral spots on carapace; sternum darkened in the middle. Abdomen almost white with irregular groups of black spots. Eye region (Figure 1K) relatively narrow, posterior row recurved, AME slightly smaller than ALE, on a small projection, PLE 2 diameters apart. Chelicerae (Figure 1G,H) with a proximolateral protrusion which is as large as basal segment of chelicera, proximal half with transverse grooves on the lateral surface, tip of protrusions bifid: a dorsal rounded and a ventral more or less conical tip, both darkened. Legs, particularly tibiae, metatarsi and tarsi, densely covered with stiff straight hair, 2-8 times the leg diameter. Palp as in Figure 1I,J, bulb slender, embolus in prolongation of it, paracymbium widening distally.

Female

Measurements in mm: female paratype (WAM 92/636): total length 5.30, carapace 2.15 long, 2.15 wide, width eye region 0.55, abdomen 4.10 long. Legs:

	femur	patella	tibia	metatarsus	tarsus	total
I	13.45	0.95	14.40	18.70	2.90	50.40
II	9.60	0.95	9.60	13.90	2.15	36.20
III	7.20	0.95	6.70	9.40	1.45	25.70
IV	10.10	0.95	9.10	12.75	1.90	34.80
palp	0.60	0.20	0.25		0.50	

Measurements of a small female (WAM 92/643): total length 2.90, carapace 1.20 long, 1.10 wide, width eye region 0.35, femur I 6.00. Measurements of the other specimens not much disparate to the measured specimens. Markings (Figure 1K) as in the male, AME a little smaller than laterals and almost touching them, PME only one diameter apart. Chelicerae without stridulatory ridges. Epigyne (Figure 1L,M) a chitinized pre-genital transverse arch, excavated in the middle and a post-genital tranverse strip; atrium membranous, with ventrally an arched transverse valve with a double rounded elevation in the middle, and internally (postero-dorsally) a transverse bar, hinged on lateral extremities of the epigynal plate and provided with a pair of reniform flexible appendages (Figure 1N).

Remarks

Another, closely related but smaller species was collected from a cave on Barrow Island. The material comprises one adult specimen only (female) which in this case I consider insufficient to describe.

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